

MINING PROPERTIES
AMERICAN ZINC, LEAD AND SMELTING COMPANY
MISSOURI PORTION, TRI-STATE DISTRICT

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Jasper County
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AMERICAN ZINC, LEAD AND SMELTING COMPANY
MISSOURI PORTION, TRI-STATE DISTRICT

I. INTRODUCTION

This report presents a brief description of the mining activities of the AZL&S Company in the Missouri portion of the Tri-State mining district of Missouri, Kansas, and Oklahoma. This district was formerly the largest producer of zinc and lead in the world, with mining operations commencing in 1838, and continuing until 1970, when all production ceased. The district is generally credited as having produced about 500,000,000 tons of crude ore, of which 200,000,000 tons came from Oklahoma, 175,000,000 tons from Missouri, and 125,000,000 tons from Kansas. Percentagewise these figures are; Oklahoma 40 percent; Missouri 35 percent; and Kansas 25 percent.

AZL&S Company.--- This company entered the district in 1899, with the acquisition of Missouri mining properties totaling some 2,700 acres of fee land, and about 1,300 acres of mining leases. From this beginning the company operated continuously for the next 55 years both as a mine operator, and also as a mining property lessor to other mining companies, with its final mining operation in Missouri being closed in 1954. During this period it operated for its own account a total of 13 separate mining units, which were variously located in Jasper, Newton, and Lawrence Counties. Land holdings varied from year to year, with fee-lands being bought and sold, and with leased-lands being acquired or surrendered. The company has no property rights in the district at the present time, having sold its last holdings during the early 1970's.

A description for each of the former mines operated by the company, together with a location map, are attached.

Mine Production Records. -- Mine production figures for individual mines, outside of old company records, are only partially available, being scattered in old reports by the State Geological Survey, State Mine Inspector, U. S. Bureau of Mines, and the weekly production summaries from microfilms of old newspaper files. Much of this information can be reviewed locally at the libraries of the Missouri Southern State College, the Tri-State Mineral Museum, Joplin Public Library, and the newspaper office. The early production records from the old State and Federal reports usually tabulate only concentrates produced, which requires a conversion to tons mined by using an assumed concentration ratio. After 1907 the U. S. Bureau of Mines commenced keeping records for tonnage mined, but this information is confidential for individual mines.

AZL&S Operations. -- With respect to the AZL&S Company's operated mines, we were fortunate to have semi-detailed production records for the Davey, Hunter, and Quick Seven mines in the writer's personal files. Also available was a report by the writer, dated September 1963, which contained the total production from company mines in the district (on 5-year incremental periods) from 1899 to 1962. With these reports, and reasonably accurate production figures from Oklahoma and Kansas, a breakdown for the individual mines in Missouri was possible. The mine tonnage for company operations by States (ex-lessees) from 1899 to 1962 is as follows:

| <u>State</u> | <u>Tons Mined (1899-1962)</u> | <u>AZL&S Production by States (%)</u> | <u>AZL&S % of Total State Production</u> |
|--------------|-----------------------------------|---|--|
| Missouri | 10,431,453 | 66.2 | 5.96 |
| Oklahoma | 5,016,472 | 31.8 | 2.51 |
| Kansas | 320,570 | 2.0 | 0.26 |
| <u>Total</u> | <u>15,768,495</u> | <u>100.0</u> | <u>3.15 (District)</u> |

Note: Above figures are subject to revision, and do not include mine tonnage from lessee operations.

Table I showing AZL&S Company's Missouri operations, by Mines, Period Operated, and Adjusted Tons Mined, follows:

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Table 1

MINING PROPERTIES OPERATED BY
AMERICAN ZINC, LEAD AND SMELTING COMPANY
MISSOURI PORTION, TRI-STATE DISTRICT
(1899-1954)

| <u>MINE</u> | <u>PERIOD OPERATED</u> | <u>ADJUSTED TONS MINED</u> |
|--------------------------------------|------------------------|--------------------------------|
| 1. Yellow Rose | 1899-1900 | 1,000 |
| 2. Hockaday | 1904-1913 | 257,719 |
| 3. Davey | 1905-1920 | 7,342,862 * |
| 4. Vogey | 1909-1918 | 1,056,696 |
| 5. Gundling | 1911-1912 | 5,000 |
| 6. Boyd | 1912 | 5,000 |
| 7. Granby Mines (4) | 1916-1919 | 289,012 |
| 8. Concord | 1920 | 5,000 |
| 9. High Five | 1922-1927 | 397,231 |
| 10. Smith-Love | 1933-1935 | 75,000 |
| 11. Henckel-Smith | 1943-1944 | 230,773 |
| 12. Hunter | 1943-1947 | 303,204 * |
| 13. Quick Seven (1) | 1952-1954 | 462,956 * |
| <u>TOTAL COMPANY MINE PRODUCTION</u> | | <u>10,431,453 *</u> |

NOTE: * Denotes actual production figures, balance of mine tonnages adjusted from production records compiled on 5-year intervals.

(1) Joint Venture operation with Brown & Root, Houston Texas.

Lessee Operations. -- In recent investigations of the district by the EPA regarding possible contamination problems from previous mining operations, the responsibility formula as presently used includes lessee mine tonnage as a part of the lessor's production. All of the major mining companies engaged in, and encouraged, lessee operations for the smaller ore deposits, and for clean-up work in mines nearing depletion. Accurate lessee mine tonnage figures are not generally available, since the royalty settlements are made on concentrates sold, not on tons mined. Most of the lessees were rather responsible operators, and usually reported their mine tonnage to the weekly newspaper production tables.

The lessee tonnage from AZL&S properties was rather substantial, and a search of the old newspaper files is planned. A list of company lands that supported lessee operations follows:

| <u>Property</u> | <u>Location</u> | <u>Acres</u> |
|-------------------|-----------------|---------------|
| 1. Center Valley | N. Webb City | 120 |
| 2. Cornfield | S. Cartersville | 80 |
| 3. Interurban | Central City | 40 |
| 4. Midway Fee | E. Joplin | 200 |
| 5. Midway Lease | E. Joplin - | 80 |
| 6. Mo. Central | Central City | 51 |
| 7. Porter | Central City | 200 |
| 8. Richland | S. Cartersville | 30 |
| 9. Granby Area | Granby | Large Acreage |
| 10. Oronogo Lands | Oronogo | 437 |
| 11. Joplin Lands | NW Joplin | 590 |

II. AZL&S MINING OPERATIONS

1. Yellow Rose Mine. -- The Yellow Rose mine was located in the Central City subdistrict, lying 5 miles west from Joplin, and was the first mining operation of the company. According to James D. Norris, who wrote A History of the American Zinc Company (1968), this mine was purchased and operated in November and December 1899, and resulted in a financial disaster, with the shallow ore deposit being exhausted in two months. Norris states that after spending \$20,418 in purchase price and equipment, the gross returns were only \$4,130, leaving a net loss, including sale of the mill, of \$14,788. After this "folly" the directors of the company decided (until 1904) that the company would henceforth limit its activities to mine leasing, and would not mine for its own account. We can find no records for this mine in our engineering and geological files, the tonnage produced is included in the production summary for 1899-1905.

2. Hockaday Mine. -- This mine was located in the Center Creek bottoms, just south of Oronogo, and consisted of 73 acres lying in the W $\frac{1}{2}$ of the NE $\frac{1}{4}$ of Sec. 6, T28N, R32W, less 7 acres occupied by a cemetery. The Hockaday was one of the original land parcels in the 1899 acquisition, and was the site for American Zinc's first experiment in the bulk mining of a low-grade, sheet-ground ore deposit. Mining operations were commenced in late 1904, and were continued successfully until the mine closed in 1913.

3. Davey Mine. -- This mine was the largest underground mining operation in southwestern Missouri, and was the backbone for American Zinc's mining activities from 1905 to 1920. The property was part of the original 1899 land acquisition, and included seven contiguous tracts of fee and leased land, totaling 710 acres, lying one mile southeast from Carterville. These land holdings were situated in portions of Secs. 16, 17, 20,

and 21, T28N, R32W, and consisted of the fee ownership to the Davey (400-acres), Stout (120-acres), Tower (20-acres), and Richland (15-acres) tracts; and leaseholds to the Burch (20-acres), Chinn (40-acres), Cornfield (80-acres), and Richland (15-acres) tracts. The mining operations here were situated in the low-grade, sheet-ground ore zone, and were the envy of the district as a low-cost, large tonnage producer. The mine production, which averaged 2,500 tons per day, was treated in four concentrating mills equipped with the latest technology.

4. Vogey Mine. -- The Vogey mine was another low-cost, high-tonnage mine producing from the sheet-ground ores of the Duenweg-Oronogo trend. This property was located two miles south from the Davey mine, at the site of the now abandoned mining community of Porto Rico. The land holdings consisted of two forty acre tracts, lying one quarter mile apart, owned in fee simple. These tracts comprised the December forty (NE $\frac{1}{4}$ of the NW $\frac{1}{4}$), and the July forty (SE $\frac{1}{4}$ of the NE $\frac{1}{4}$), both situated in Sec. 34, T28N, R32W. Mining operations by the company began in 1909, and continued until 1918, with peak production being in the 300 to 500 tons per day range. The mine closed following the reduction of zinc prices at the end of World War I.

5. Gundling Mine. -- This property was a small producer, located 32 miles east from Joplin, lying in the Stotts City subdistrict of Lawrence County. We can find no information as yet concerning the acreage controlled, or the tonnage produced, except that it operated for a short period from 1911 to 1912. This subdistrict was one of short lived, small mines occurring in upper-ground, collapsed breccias, and contained no important ore producers. For this report an estimated production of 5,000 tons has been used.

6. Boyd Mine. -- The Boyd mine was located in the Diamond subdistrict, and was a disappointing venture to develop a meaningful mine in an outlying mining area. This property was owned in fee simple, and contained 160 acres, lying in the SE $\frac{1}{4}$ of Sec. 15, T26N, R31W, Newton County. After a period of prospecting the mine was operated for a short time during 1912, and was soon closed as being unprofitable. The ore deposits of this subdistrict are mostly small-sized, upper-ground, collapsed breccias of limited horizontal extent. An estimated production of 5,000 tons was used in this report.

7. Granby Mining and Smelting Company. -- This company was the largest mining organization in the district, having started mining activities in the Granby subdistrict in 1865. Through the following years it acquired the fee ownership to large tracts of mining land in the Granby, Joplin, and Oronogo subdistricts, plus some 30,000 acres of scattered tracts believed to contain mineral possibilities. This company established a modern lead smelter at Granby in 1873, plus one at Joplin in 1877, and later built zinc smelters at Neodesha, Kansas, and near East St. Louis, Illinois. The mining policy of the company was restricted to the leasing of its lands to a large following of small mine operators, with the company supplying mine machinery and concentrating facilities were necessary.

On June 2, 1916 the AZL&S Company purchased the Granby Mining and Smelting Company for \$8,000,000, and assumed the management of its operations. At this time the larger mines of the Granby Company included the Klondike, Mascot, and Golden Rule mines at Granby, and the B. & H. mine northwest of Joplin. In addition to continuing the lessee operations AZL&S took over the operation of the above mentioned mines, with the Mascot, Golden Rule, and B. & H. mines being closed in 1917, and the Klondike being closed in 1919. Following World War I limited mining by lessees was continued until September 1930, when all of the properties in the Granby subdistrict were sold to the Federal Mining and Smelting Company (Asarco).

The remaining portions of the Granby Company's property, including the lands in the Joplin and Oronogo subdistricts, were not a part of this sale, and continued as lessee operations from the AZL&S Company until 1957, when all mining in Missouri ceased.

8. Concord Mine. -- The Concord mine was situated within the city limits of Cartersville, and was located in the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Sec. 17, T28N, R32W. The ore deposits here were upper-ground, collapsed breccias, and were previously mined by the early operators in the district. This property was leased by the AZL&S Company in 1920, and after mining for less than one year, it was closed as being unprofitable. Production from this mine was probably in the 5,000 ton range, but is included in the total 5-year incremental tonnage figures.

9. High Five Mine. -- This mine was located in the Waco subdistrict, 16 miles northwest from Joplin, and was operated by the company from 1922 to 1927. The property comprised approximately 80 acres, lying in the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$, and the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of fractional Sec. 15, T29N, R34W, and was subleased from the High Five Mining Company, the original developers. The ore deposits of this area consisted of a number of large, filled-sink structures, that contained some of the richest ore in the district. Total mine production by AZL&S Company is estimated to have been nearly 400,00 tons, with the actual tonnage being included in the total Missouri production by the company.

10. Smith-Love Mine. -- This mining operation consisted of two separated mines, lying on adjacent land parcels, that were mined at the same time, and were considered as a single operating unit. The property was located in the Diamond subdistrict, 19 miles southeast from Joplin, and 2 miles southwest from the town of Diamond. The Smith mine was on a 320 acre mining lease, covering the SW $\frac{1}{4}$, the W $\frac{1}{2}$ of the SE $\frac{1}{4}$, and

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the W $\frac{1}{2}$ of the NE $\frac{1}{4}$ of Sec. 16, T26N, R31W. The Love mine was on a 160 acre mining lease, consisting of the NW $\frac{1}{4}$ of Sec. 16, T26N, R31W. These mines were both small, upper-ground, collapsed breccia ore deposits, that were discovered by the company as part of a Schlumberger geophysical survey made during 1929 and 1930. This mining operation was commenced in 1933 and was terminated in 1935 with the exhaustion of the better grade ore. Mine production figures for these mines are not presently available, but are included in the total tonnage by AZL&S for Missouri mining.

11. Henckel-Smith Mine. -- These mines were also considered as a single operating unit, since they were situated on contiguous land parcels and were operated at the same time. These properties were situated at the south end of the Duenweg-Oronogo ore trend, were located just south of the Jasper-Newton County line, approximately 10 miles southeast from Joplin, and 4 miles southeast from Duenweg. The Henckel tract consisted of a 400 acre mining lease lying in the W $\frac{1}{2}$, the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$, and the NW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Sec. 24, T27N, R32W. The Smith tract comprised a 80 acre mining lease covering the N $\frac{1}{2}$ of the SE $\frac{1}{4}$ of Sec. 23, T27N, R32W. The Henckel mine was a moderate sized, upper-ground collapsed breccia ore deposit, while the Smith mine was a small, lower-ground, sheet-ground deposit. These mines were discovered by the company as part of the Schlumberger geophysical survey of 1929-1930, and were mined from 1943 to 1944 with the ore reserves being depleted. The actual production figures are not presently available, but are included in the total tonnage mined by AZL&S in Missouri.

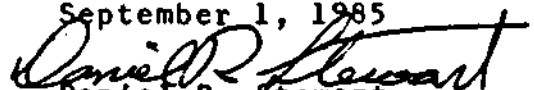
12. Hunter Mine. -- The Hunter mine was located in the Aurora subdistrict, 52 miles east and south from Joplin, and 1 mile southeast from Aurora, Lawrence County. The mine itself occupied portions of four contiguous mining subleases totaling 110 acres, that included the Werdien, Robberson, McCallister, and Metcalf tracts, lying in the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Sec. 7, and

the W½ of the NE¼ of Sec. 18, T26N, R25W, Lawrence County. The principal ore deposit was an elongated, vertical fracture system, occurring in the Reeds Spring formation, that extended in a north-south direction for more than 2640 feet. In addition a smaller, upper-ground, collapsed breccia deposit was mined on the Werdien tract. Mining operations were commenced in 1943 and terminated in 1947 with the depletion of the ore deposits. Mine production figures from old company records total 303,204 tons of crude ore.

13. Quick Seven Mine. -- The Quick Seven mine was a large open pit mining operation, which was mined during the years 1952 to 1954 by a Joint Venture between the AZL&S Company and Brown and Root Inc. of Houston, Texas. This property was located 16 miles north and east from Joplin, and 2 miles northwest from Neck City. The mined area included portions of Lots 2 and 3 of the NE¼ of Sec. 1, T29N, R33W, and Lots of the NW¼ of Sec. 6, T29N, R32W, Jasper County, Missouri. In addition the Joint Venture purchased the fee ownership to Lot 1 of the NW¼ of Sec 1, T29N, R32W, covering 62.79 acres, for the mill site. The area mined was a large filled-sink structure containing three separate upper-ground ore bodies, that were formerly mined by underground methods prior to 1918. This property was reopened during the Korean Conflict to recover ores presumably left behind by the former operators. The remnant ore reserves were highly overstated, with the mine being depleted in 20 months of operation. Mining records from former company reports show a total production of 462,956 tons of crude ore milled at this property.

END

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